**Table S1.** Local name, race and spatial distribution of the studied population made of 84 African landraces and 4 reference genotypes (controls)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | CIRAD No. | Synonym | Local name | Race | Origin (Location and Country) | Geographic region | Longitude W | Latitude N |
| 1 | 660 | 6502\* | BAMBERI BODEDJO S 2 | G ma | Séfa, SEN | UC | -15.55 | 12.78 |
| 2 | 661 | 5027\* | BANING MENGO | G ga | Saria, BFA | - | -2.15 | 12.26 |
| 3 | 662 | 6601\* | BASSI N° 4 | G ga | Séfa, SEN | UC | -15.55 | 12.78 |
| 4 | 663 | 6613\* | BASSI N° 5 | G ga | Séfa, SEN | UC | -15.55 | 12.78 |
| 5 | 665 | 6726\* | BASSI M'BODIENE | G ga | M'Bodiene, SEN | GB | -16.87 | 14.25 |
| 6 | 666 | 6208\* | BASSI TOURKA 1 | G ga | Kaolack, SEN | GB | -16.07 | 14.13 |
| 7 | 669 | 5050\* | BAZAROMBA | GC | Tarna, NER | - | 7.11 | 13.44 |
| 8 | 670 | 51149\* | BODERI | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 9 | 951 | 5001\* | CONGOSSANE | G ga | Bambey, SEN | GB | -16.46 | 14.70 |
| 10 | 953 |  | CONGOSSANE MERINA SARR | C | M'Backe, SEN | GB | -15.91 | 14.80 |
| 11 | 956 | 6748\* | CONGOSSANE N°10 | G ga | Bambey, SEN | GB | -16.46 | 14.70 |
| 12 | 958 | 6750\* | CONGOSSANE N°15 | G ga | Bambey, SEN | GB | -16.46 | 14.70 |
| 13 | 961 | 6753\* | CONGOSSANE N°45 | G ga | Bambey, SEN | GB | -16.46 | 14.70 |
| 14 | 962 | 6754\* | CONGOSSANE N°48 | G ga | Bambey, SEN | GB | -16.46 | 14.70 |
| 15 | 963 | 6755\* | CONGOSSANE N°57 | G ga | Bambey, SEN | GB | -16.46 | 14.70 |
| 16 | 964 | 7114\* | DIAKHNATE RT 50 | D | SRV, SEN | SRV | -15.00 | 16.33 |
| 17 | 965 | 5688\* | ECHANTILLON N°18 (1) | D | Unknown | - | - | - |
| 18 | 967 |  | FELLAH BLANC 2 | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 19 | 968 | 5345\* | FELLAH BLANC OGO | C | SRV, SEN | SRV | -16.64 | 15.99 |
| 20 | 969 | 51-120\* | FELLAH AERE | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 21 | 970 | 51145\* | FELLAH ORE FONDE | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 22 | 971 |  | FELLAH | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 23 | 972 | 5344\* | FELLAH ROUGE 2 | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 24 | 973 | 51151\* | FELLAH ROUGE 3 | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 25 | 975 | 5079\* | FLATTIE BA | G ga |  M’Pesoba, MLI | - | -5.70 | 12.61 |
| 26 | 983 |  | KENELE | G ga |  Unknown- | - | - | - |
| 27 | 984 | 5076\* | KENINKE-BA | G ga | M’Pesoba, MLI | - | -5.70 | 12.61 |
| 28 | 985 | 5077\* | KENINKE-BA BLANC | G ga | M’Pesoba, MLI | - | -5.70 | 12.61 |
| 29 | 993 | 5704\* | MANGA BOROM | G ga | Casamance, SEN | Casamance | -16.76 | 12.55 |
| 30 | 994 | 6321\* | HEGUERI | C | Kaédi, MRT | SRV | -13.51 | 16.15 |
| 31 | 1013 | 5340\* | N'BAYERI BLANC | G | SRV, SEN | SRV | -16.64 | 15.99 |
| 32 | 1014 | 63108\* | SAMBADIOBO | G | Ouassadou, SEN | Casamance | -13.81 | 13.23 |
| 33 | 1015 | 5349\* | POURDI BLANC | G | SRV, SEN | SRV | -16.64 | 15.99 |
| 34 | 1017 | 7109\* | POURDI SD 10 | CK | SRV, SEN | SRV | -16.64 | 15.99 |
| 35 | 1034 | 6320\* | RASSOULOU | CG | Kaédi, MRT | SRV | -13.51 | 16.15 |
| 36 | 1035 | 5346\* | SAMBA GUERI OGO | GK | SRV, SEN | SRV | -16.64 | 15.99 |
| 37 | 1037 | 51162\* | SAMBA SOUKI M'BILOR | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 38 | 1038 | 7105\* | SAMBA SOUKI SD 3 | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 39 | 1039 | 7106\* | SAMBA SOUKI SD G | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 40 | 1040 | 7108\* | SAMBA SOUKI RT 13 | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 41 | 1041 | 51137\* | SARAKOLE M'BILOR | D | SRV, SEN | SRV | -16.64 | 15.99 |
| 42 | 1042 | 6704\* | SAROSSO RT 44 | KC | Richard Toll, SEN | SRV | -15.70 | 16.45 |
| 43 | 1043 | 6416\* | SENGUIRANE | GK | Mont-Rolland, SEN | GB | -16.98 | 14.93 |
| 44 | 1044 | 6323\* | SEVYL N'DANERY | D | Kaédi, MRT | SRV | -13.51 | 16.15 |
| 45 | 1045 | 5343\* | SEVIL | KD | SRV, SEN | SRV | -16.64 | 15.99 |
| 46 | 1046 | 5338\* | SEVIL YOUDOWA | DB mb | SRV, SEN | SRV | -16.64 | 15.99 |
| 47 | 1047 |  | IRAT 4 | G ga |  Bambey, SEN | GB | -16.46 | 14.7 |
| 48 | 1050 | 6407\* | SORGHO DIALAKOTO | G ma | Dialakoto, SEN | ES | -13.30 | 13.31 |
| 49 | 1051 |  | SORGHUM PANICULA N°6 | G ga | MOZ | - | - | - |
| 50 | 1052 | 7640\* | SORGHO SUD | C | GB, SEN | GB | - | - |
| 51 | 1053 | 6401\* | BASSI Gandiaye | C | Gandiaye, SEN | GB | -16.27 | 14.23 |
| 52 | 1054 | 6603\* | BASSI | G ga | Sinthiou-Malème, SEN | ES | -13.92 | 13.82 |
| 53 | 1055 | 5337\* | TIGNE | G ga | Sine Saloum, SEN | GB | - | - |
| 54 | 1057 | 63104\* | TIGNE DE DANGALMA | G ma | Dangalma, SEN | GB | -16.57 | 14.73 |
| 55 | 1058 | 6215\* | WEYDE 1 | G ga | Kaolack, SEN | GB | -16.07 | 14.13 |
| 56 | 1059 | 6217\* | WEYDE 2 | G | Kaolack, SEN | GB | -16.07 | 14.13 |
| 57 | 1081 | 5002\* | GOR GATNA 2 | C | Thies, SEN | GB | -16.86 | 14.81 |
| 58 | 1082 | 5004\* | GOURGA | C | Bambey, SEN | GB | -16.46 | 14.70 |
| 59 | 1397 | 5003\* | GOURGA TENIA | D | Bambey, SEN | GB | -16.46 | 14.70 |
| 60 | 1398 |  | FELLAH BLANC 3 | D | Bambey, SEN | GB | -16.46 | 14.70 |
| 61 | 1404 |  | DIERIKER-N'DELE | CD | SRV, SEN | SRV | -16.64 | 15.99 |
| 62 | 1408 |  | 54-07 | CK |  Unknown | - | - | - |
| 63 | 1412 | 5702\* | KENTE MANE | G ma | Ziguinchor, SEN | LC | -16.27 | 12.55 |
| 64 | 1413 | 5707\* | SANS NOM (SEN 1) | KG | Bambey, SEN | GB | -16.46 | 14.70 |
| 65 | 1419 | 6304\* | MANGA WOULING BACON | G | Casamance, SEN | Casamance | -16.76 | 12.55 |
| 66 | 1422 | 6506\* | S9 DJIKILING - BODEDJO | G ma | Séfa, SEN | UC | -15.55 | 12.78 |
| 67 | 1425 | 6610\* | G 63 | C | Guedé, SEN | SRV | -14.78 | 16.53 |
| 68 | 1426 | 5010\* | FELLAH BLANC 4 | D | Wakhaldiam, SEN | GB | -16.39 | 15.76 |
| 69 | 1792 | 9017\* | SL 179 | C | Toubakouta, SEN | GB | -16.48 | 13.78 |
| 70 | 1793 | 9078\* | SL 516 | G ga | SEN | - | - | - |
| 71 | 1794 | 9019\* | SL 478 | G ga | SEN | - | - | - |
| 72 | 1795 | 9020\* | SL 591 | G ga | SEN | - | - | - |
| 73 | 1796 | 9101\* | SL 306 | G ma | Ouro Binta, SEN | ES | -13.70 | 14.02 |
| 74 | 1797 | 9102\* | SL 456 | G ma | Kinto, SEN | UC | -14.43 | 12.97 |
| 75 | 1798 | 9103\* | SL 646 | G ga | SEN | - | - | - |
| 76 | 1914 | 5801\* | NIENIKO | G gi | Kayes, MLI | - | -11.43 | 14.45 |
| 77 | 1916 | IS19957\*\* | NIENIKO BIS 16-81 | G fs | Mboune, SEN | SRV | -13.56 | 14.7 |
| 78 | 1917 | IS19966\*\* | NIENIKO SG 1687 | G fs | Paraouol, SEN | ES | -.13.49 | 14.22 |
| 79 | 1918 | IS19981\*\* | BASSI TIN | G fs | Ndiaye Ndiaye, SEN | GB | - | - |
| 80 | 1919 | IS19984\*\* | BASSI SG 1723 | G fs | Ndiamane, SEN | GB | -16.85 | 14.31 |
| 81 | 1920 | IS20010\*\* | BASSI SG 1771 | G fs | Payar, SEN | ES | -14.5 | 14.45 |
| 82 | 1921 | IS20021\*\* | BAYERI SG 1805 | G | Ouro Binta, SEN | ES | - | - |
| 83 | 1923 | IS20067\*\* | BINDA | G ga | Landieni, SEN | ES | -12.36 | 12.55 |
| 84 | 1924 | IS20073\*\* | DIGAFF | G  | Etiolo, SEN | ES | -12.83 | 12.58 |
| **4 CONTROLS** |  |  |  |  |  |  |  |
| 85 |  | IS21260\*\* | 104GRD  | C | KEN | - | - | - |
| 86 |  |  | F221 | B | MLI | - | - | - |
| 87 |  | IS23566\*\* | IS23566 | GC | ETH | - | - | - |
| 88 |   | 8733\* | CSM-63 | G | MLI | - | - | - |

\*and\*\*: Registration number in ISRA and ICRISAT data bases respectively.

Race designations : G, Guinea; C, Caudatum; D, Durra; K, Kafir; CK, Caudatum-kafir; GC, Guinea-cautatum.

Sub-race designations : ma, margaritiferum; ga, gambicum; mb, membranaceum; gi, guineense; fs, Senegal group .

Country codes: ETH, Ethiopia; KEN, Kenya; MLI, Mali; MRT, Mauritania; MOZ, Mozambique; SEN, Senegal.

Codes of geographic regions in Senegal: SRV, Senegal River valley; GB, Groundnut Basin; ES, Eastern Senegal; UC, Upper Casamance; LC, Lower Casamance;

**Table S2.** Correlation matrix between variables measured on the studied population of 88 accessions for July sowing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | DSFLO | PH | DIAM | IN | INL | BMAT | SCT | SCC | HMAT | JW | JP | SDW | PDW | LDW |
| PH | 0.164 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DIAM | 0.445\*\*\* | 0.031 |  |  |  |  |  |  |  |  |  |  |  |  |
| IN | 0.856\*\*\* | 0.246\* | 0.646\*\*\* |  |  |  |  |  |  |  |  |  |  |  |
| INL | -0.437\*\*\* | 0.729\*\*\* | -0.39\*\*\* | -0.459\*\*\* |  |  |  |  |  |  |  |  |  |  |
| BMAT | -0.010 | 0.025 | 0.128 | 0.056 | 0.009 |  |  |  |  |  |  |  |  |  |
| HMAT | 0.073 | 0.033 | 0.637\*\*\* | 0.513\*\*\* | -0.312\*\* | 0.401\*\*\* |  |  |  |  |  |  |  |  |
| SCT | 0.336\*\* | -0.279\* | 0.092 | -0.005 | -0.239\* | 0.504\*\*\* | 0.483\*\*\* |  |  |  |  |  |  |  |
| SCC | 0.010 | -0.539\*\*\* | 0.168 | 0.032 | -0.516\*\*\* | -0.010 | 0.375\*\*\* | 0.662\*\*\* |  |  |  |  |  |  |
| JW | 0.145 | -0.164 | 0.312\*\* | 0.213 | -0.284\* | 0.172 | 0.522\*\*\* | 0.423\*\*\* | 0.389\*\*\* |  |  |  |  |  |
| JP | -0.025 | -0.300\*\* | 0.119 | 0.002 | -0.280\* | 0.166 | 0.184 | 0.251\* | 0.368\*\*\* | 0.802\*\*\* |  |  |  |  |
| SDW | 0.447\*\*\* | 0.289\*\* | 0.752\*\*\* | 0.654\*\*\* | -0.190 | 0.120 | 0.735\*\*\* | -0.028 | -0.009 | 0.395\*\*\* | 0.074 |  |  |  |
| PDW | -0.410\*\*\* | 0.321\*\* | 0.098 | -0.215 | 0.443\*\*\* | -0.050 | -0.040 | -0.273\* | -0.265\* | -0.246\* | -0.255\* | 0.182 |  |  |
| LDW | 0.529\*\*\* | -0.025 | 0.783\*\*\* | 0.675\*\*\* | -0.480\*\*\* | 0.199 | 0.545\*\*\* | 0.075 | 0.135 | 0.311\*\* | 0.143 | 0.734\*\*\* | 0.007 |  |
| GLMAT | 0.257\* | 0.110 | 0.183 | 0.222\* | -0.040 | -0.008 | 0.175 | -0.040 | 0.098 | 0.156 | 0.115 | 0.321\*\* | 0.008 | 0.374\*\*\* |

\* *P* < 0.05, \*\* *P* < 0.01, \*\*\* *P* < 0.001

**Table S3.** The three clusters from hierarchical clustering based on Euclidian distances

|  |  |  |  |
| --- | --- | --- | --- |
|  | Cluster I(37 accessions) | Cluster II(15 accessions) | Cluster III(36 accessions) |
| **Phenology** |  |  |  |
| KP | 0.5±0.18a | 0.67±0.19b | 0.46±0.25a |
| DSFLO | 81±6a | 93±11b | 86±11b |
| **Morphology** |  |  |  |
| PH | 329.1±37b | 374±32.1c | 275.7±38a |
| DIAM | 14.3±1.4a | 17.2±1.6b | 16.3±2.1b |
| IN | 12.7±1.4a | 15.7±1.6c | 13.9±2.1b |
| INL | 21.6±2.3b | 20.3±2.4b | 17±2.8a |
| SDW | 92.7±24.4a | 170±39.6c | 126.4±51.4b |
| LDW | 24.8±9.8a | 41.4±9.4b | 36.9±12.8b |
| GLFLO | 6.5±1.3a | 7.1±1a | 6.9±1.3a |
| GLMAT | 1.4±0.9a | 2.0±1.1a | 1.7±1a |
| **Sugar production** |  |  |
| BFLO | 13.7±1.5b | 12.4±1.8a | 13.2±1.7ab |
| BMAT | 15.2±2.9a | 14.9±2.5a | 16.6±2.4a |
| SCT | 17.4±6.9a | 33.8±11.7b | 36.7±16.4b |
| SCC | 184.4±54.7a | 183.7±24.7a | 281.1±51b |
| HMAT | 57.0±4.7a | 58.8.±3.7a | 63.7±6.0b |
| JW | 23.7±17.5a | 41.8±23.2a | 64.9±39.1b |
| JP | 0.1±0.08a | 0.1±0.05a | 0.18±0.12b |
| **Grain production** |  |  |
| PDW | 30.5±10.7b | 34.5±18.8b | 23.3±8.6a |

The traits mean with different letters are statistically different (P< 0.05).

**Table S4.** The most discriminant traits of the studied population

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Wilks (Lambda) | F | p-value |
| PH | 0.496 | 43.246 | < 0.0001 |
| SCC | 0.512 | 40.462 | < 0.0001 |
| INL | 0.582 | 30.472 | < 0.0001 |
| SCT | 0.632 | 24.757 | < 0.0001 |
| SDW | 0.676 | 20.350 | < 0.0001 |
| JW | 0.693 | 18.831 | < 0.0001 |
| IN | 0.714 | 17.035 | < 0.0001 |
| LDW | 0.721 | 16.422 | < 0.0001 |
| HMAT | 0.722 | 16.378 | < 0.0001 |
| DIAM | 0.766 | 12.956 | < 0.0001 |